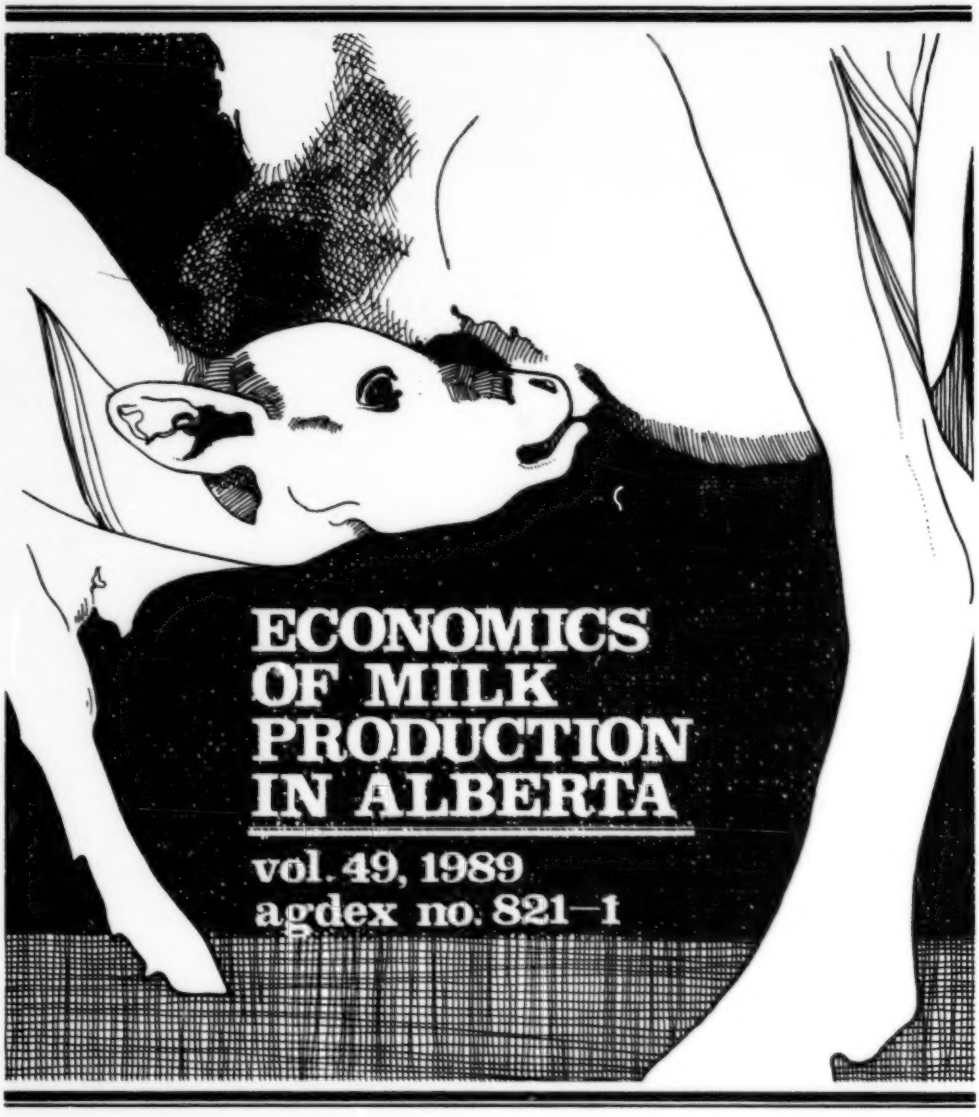

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ECONOMICS OF MILK PRODUCTION IN ALBERTA, 1989

Volume 49

By
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Production Economics Branch
Economic Services Division
Alberta Agriculture
April 1990

FOREWORD

Pricing of fluid milk in Alberta is regulated by the Public Utilities Board (PUB). The Production Economics Branch conducts an annual study of dairy production costs and returns in Alberta to assist the PUB in administering fluid milk prices. This annual Dairy Cost Study was introduced during World War II and is now recognized by dairymen, consumers and the PUB as the primary reference for setting fluid milk prices.

In addition to the Dairy Cost study, the branch had developed a computerized formula which monthly monitors producer costs. The formula enables the PUB to make more frequent adjustments to the producer price in response to changes in production costs during the year. Further adjustment to the producer price can be made when the annual Dairy Cost Study is completed.

The cost of producing fluid milk increased by 9.6 per cent in 1989 in contrast to 6 per cent in 1988. The increase in feed prices was mostly responsible for this change. As the fluid milk price increases did not fully cover the cost increase, the annual return to equity fell from 15.9 per cent in 1988 to the 12.8 per cent in 1989.

Dr. Carlyle Ross, Branch Head
Production Economics Branch

NOTE

This report was prepared from farm records of a selected number of fluid milk producers in Alberta who voluntarily participated in this project. Their participation was greatly encouraged by the Alberta Fluid Milk Producers' Association. The Alberta Dairy Control Board provided the financial compensation to the participating producers. Allan Presiznuk from the Production Economics Branch collected and assisted with the computerization of the farm data; he also maintained personal contact with the producers throughout the year.

Rudy Susko

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I. INTRODUCTION

This study is an annual economic analysis of milk production on Alberta farms. Prior to 1974 the findings of these studies were used as the documented evidence at the Public Utilities Board hearings to set the producer price. Although a formula pricing system was adopted in November 1974, the significance of this study in overall pricing mechanism remains undiminished.

More specifically the objectives of the study are:

- to provide a continuing account of the costs and economic conditions encountered in the production of fluid milk in Alberta.
- to annually monitor the performance of the fluid milk formula pricing.
- to use the findings as a basis for the revision in the formula price.
- to provide the data for extension use, for example, farm management.
- to provide the participating dairy farmers with a personal business analysis for management purposes.

The cost of production account is a vital economic indicator in milk pricing because of the supply management nature of the industry.

II. METHOD OF ANALYSIS

Many approaches may be used to establish the cost of production on the farm. The approach taken in this study is to show the actual cost outlay taken from the farm records for a given production year. A computer program is utilized to summarize the data and calculate the weighted group averages.

The study emphasizes the overall provincial situation supported by the regional data. Since the study is annual and ongoing, the current year is compared with the previous year to make the results more meaningful. Using this approach, the information is expressed in production units such as per hectolitre of milk and per cow.

Preliminary quarterly analyses are made during the year to observe seasonal effects. However, emphasis is on the full year's operation.

1. Enterprise Identification -- There are many accounting approaches for calculating the farm cost of producing fluid milk. Some use the total farm approach, with dairy costs intermingled with others. Others use the different imputed cost items such as operating interest cost or management charge. In Alberta the dairy enterprise is defined as all activities associated with milking cows, dry cows and young dairy stock. In most cases, the dairy operator raises his own feed; the inputs of production are allocated to the dairy enterprise and the total farm according to the actual use. Consequently, the final costs of producing milk are the true costs associated only with milk production.

2. Inventory Adjustment -- Since the cost of raising young dairy stock is included in the cost of milk production, the total income includes net cattle sales and net inventory increases to show the herd growth. The cattle inventory increases are determined by subtracting the beginning year inventory from the year-end inventory. The gross income is thus composed of milk sales and inventory adjustment. If the inventory adjustment per hectolitre

of milk is excluded from the income the result is the blend price and subsidy received for milk.

3. Home Grown Feed -- The hay grown on the farm and fed to dairy livestock is valued at regional values of hay in the stock on the farm; feed grain is valued at elevator prices provided by the Alberta Grain Commission. Although hay and grain could be grown on the same farm, both are considered to be purchased from the crop enterprise. The total value of home grown feed is determined by applying the regional price to the actual quantity fed. The procedure adequately compensates for the production cost of growing home feed. The cost of purchased feed is accepted at the actual value spent each month.

4. Value of Investment and Depreciation -- The cost of production and other relevant data from this report are supposed to reflect the average conditions in the industry. The value of depreciation is based on the original value of buildings and machinery. There is also a need to estimate the current market value of the facility to determine the equity position. The market value is computed from the original value of dairy capital by updating with the inflation factors and then depreciating according to the number of years in use. This value is used for calculating the return to equity. The age of the facility is indicated by the sample of participating producers representing the total industry. The farmland is not considered as a dairy investment. Only the acreage for pasture, dairy buildings and corral location is included in the dairy. The dairy livestock inventory is valued at the prevailing market prices at the beginning of the year.

5. Imputed Costs -- There are two basic alternatives to value the economic well being of the farm enterprise. A. to determine the return to family labour including the operator labour input, and B. to determine the return to equity invested in each particular enterprise. The methods, as identified in Table 1, are quite compatible and in each case some major assumptions must be made.

In alternative A where the residual is return to family labour, the equity interest must be imputed in order to arrive at the total cost of production. The actual residual can then be measured in terms of dollars per hour of labour. On the other hand, using alternative B, the value of family labour must be imputed since there is usually no value attached to this input.

In this study the principles of the alternative B are used, i.e. the objective is to determine the percentage return to equity. The imputed value of family labour is included in the operating or variable costs. This is more practical for a number of reasons: i) incorporated farms usually allocate total labour expenses including family, ii) in reality the operator is using money during the year for living expenses and thus the imputed family labour value is compensating for this, iii) imputed interest or opportunity cost on equity, used in alternative A is a controversial issue in a period of persistent inflation of capital assets. The charges for rent are included in the cost of capital. The capital cost in this context represents the cost of ownership of resources. If resources are rented there is a charge for their use; on the other hand, if resources are owned the owner must bear the cost of depreciation and interest on debt. For group averages such classification of variable (or operating) and capital cost is very suitable.

a) Operator and family labour: the operator's actual labour may vary from almost nil on some dairy farms to the total input of labour on others. Our procedure has been to obtain a statement of the operator's labour in hours per month, then apply the rate paid for full time dairy labour (including room and board).

In determining the hourly value, if hours are not available, 2,500 hours is considered to be the working time for one man-equivalent in a 12-month period. By this method, it is felt that the process of valuing the operator's labour is equitable. This method is preferred over leaving it as a residual because of the great variability in labour time between operators. Family labour is

evaluated similar to the above, but with different wage rates according to age and working responsibilities.

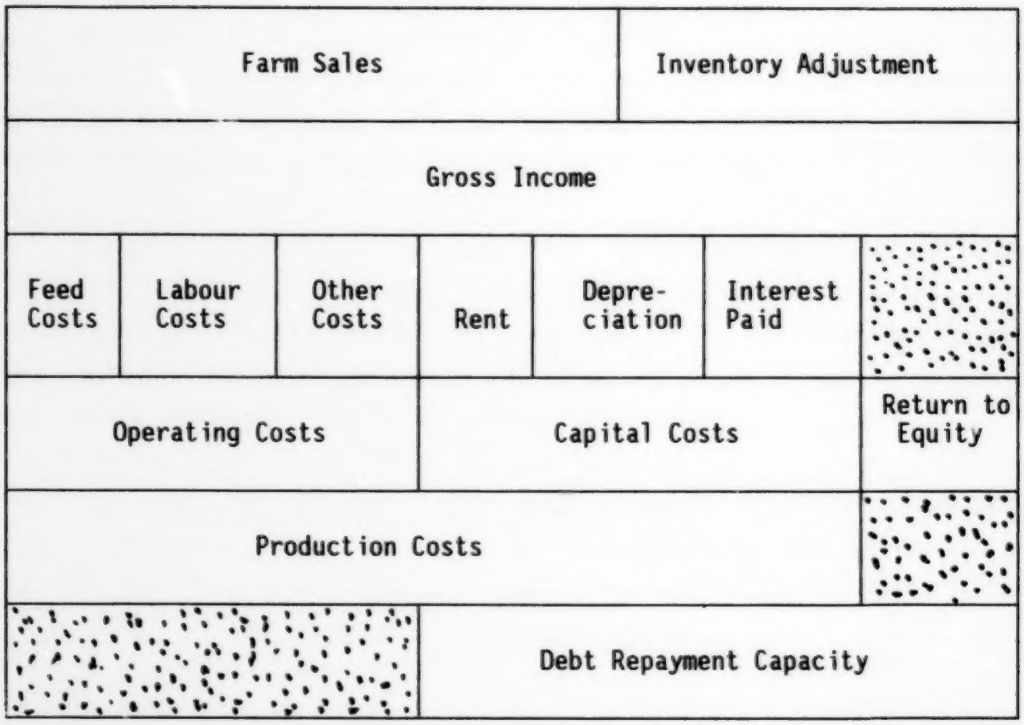
TABLE 1 ALTERNATIVE RETURNS

A. LABOUR		B. CAPITAL	
a)	Gross Income	a)	Gross Income
	Feed		Feed
	Other		Other
	Hired Labour		Hired Labour
	---		Family Labour (Imputed)
b)	Operating Cost	b)	Operating Cost
	Rent		Rent
	Depreciation		Depreciation
	Paid Interest		Paid Interest
	Equity Interest (Imputed)		---
c)	Capital Cost	c)	Capital Cost
	Return to Family Labour		Return to Equity

b) Interest on Capital: the actual interest paid on existing liabilities is included in the capital cost. To obtain this value, the participating producers were asked to report their outstanding liabilities and the interest rates they paid. This method is more accurate than reporting the annual interest payment sum. The total operating cost, plus the capital cost, account for total enterprise outlays and if subtracted from the gross income, the bottom line residual is the return on equity. The return on equity is not imputed but is left as a residual to measure the economic well-being of a farmer. If this residual is expressed as a percentage of the equity capital, then the actual return on equity could be compared with some alternative opportunity income which could be expected from Canada Savings Bonds or term deposits.

6. The Production Cost Concept: The concept of cost accounting in farming is not the same in all provinces. In Alberta, the following production cost concept is used:

DIAGRAM 1


Farm Sales
Inventory Adjustment
Gross Income
Feed Costs
Labour Costs
Other Costs
Rent
Depre-ciation
Interest Paid
Operating Costs
Capital Costs
Return to Equity
Production Costs
Debt Repayment Capacity

III. DATA COLLECTION

In order to obtain accurate dairy information from primary milk producers, all producers on the study are required to complete a detailed questionnaire of their dairy production activities each month. This questionnaire is shown in Appendix D of this report.

Research assistants collect the data, monitor the monthly collection and audit the data. This procedure ensures promptness in data collection and a minimum of recording error. The information is then entered into the computer. The computer output shown in Appendix A, B and C serves as supporting data for the report.

The analysis is based on data from fluid milk producers. Consequently the results indicate the cost level of producing fluid milk rather than industrial. The cost level for industrial milk might differ from fluid, but the difference is not substantial.

Fifty-eight dairy producers across the province submitted business information for the calendar year 1989. Two regions are recognized for the purpose of analysis. The region lying north of the 39th township is called Northern Alberta and is represented by 37 producers; the region south of the 39th township is referred to as Southern Alberta and is represented by 21 producers. The producers submitted business accounts throughout the year.

Sample

While the number of participants can change because of unforeseen circumstances, the sample size is determined statistically every year. It was established that the variance of cost of producing milk in the population of fluid milk shippers was $37.50/hL. The estimated cost was

assumed to be within a $3.00 range. The sample size was then determined by the formula.[1]

The study was designed to represent a cross-section of the producers by the milk quota size. The provincial fluid milk shippers were arranged according to the quota size from largest to smallest in each of the two regions, Southern Alberta and Northern Alberta. The sample was selected by systematic sampling to provide better representation of the population. The average quota and herd size of the sample was 791 litres and 61 cows respectively. The sample size of 66 producers was determined to be statistically sufficient to represent the total population of fluid milk shippers. Out of that group 58 producers completed reports for the 12-month period needed for the study. Some characteristics of the sample are shown in the following table.

TABLE 2 1989 SAMPLE CHARACTERISTICS

Years in Dairy	Total Sample	Indebtedness		Farm Size	
		<30%	>30%	<40	>40
	- - - - - - - per cent of the sample - - - - - - -				
Less than 10	29	3	26	6	23
More than 10	71	35	36	11	60
Total Sample	100	38	62	17	83

[1] $$n = \frac{4 \times s^2}{L^2}$$

Where: n is sample size
s is standard deviation of population
L is expected accuracy of sample

Production Conditions[1]

By late April, fodder and grain reserves were adequate in most areas except the southern districts where fodder was in short supply. In eastern districts producers began to move their cattle out to pasture in early May. The majority of Alberta cattle were released on or after the long weekend. Livestock pests were minimal.

Pasture growth was slow due to cool soil temperatures. Pastures improved in June with the rain, but in order to maintain growth in southern and eastern areas more rain was needed. Low pasture water reserves were reported in eastern areas, while those in western districts were good. In July pastures in the south deteriorated rapidly from hot dry weather and cattlemen began looking for emergency summer feed supplies. Rains in August alleviated the drought stress in most of the province. In general, cattle remained in good condition.

In general, feed grains were of fair to good quality. Only 5% of feed grains were rated as excellent. Poor quality feed grains were found in Spirit River - Fairview, northwest of Edmonton and near High River.

Only 7% of feed and straw were rated poor in quality. Over half was of good quality and a third of fair quality. Feed moved into southern areas from northern and central Alberta. A description of feed supplies as of November 30, 1989 is outlined below by region.

Southern Region

A deficit of feed and straw was reported in the Vulcan area with possible shortfalls in the Foremost, Cardston and Nanton areas. Most concern was for a shortage of feed and bedding straw. Most feed moving into deficit areas was from irrigated areas or central Alberta.

---

[1]As reported by Statistics Branch of Alberta Agriculture.

South Central Region

There was a deficit of feed and straw in the High River and Oyen-Hanna areas. Greenfeed prices were around $55/ton. There were possible shortfalls of feed grains in many areas of the region east of Strathmore.

North Central Region

Possible shortfalls of feed and straw existed in the Stettler - Lougheed area. Much of the hay available was of fair quality. Greenfeed was of good to excellent quality and selling between $25 and $40/ton. Feed grains were generally adequate. Barley and oat feed was of fair to good quality.

North East Region

Feed grain supplies were adequate to surplus while feed and straw were adequate. There was a possible shortfall of hay near Vermilion. Feed and feed grains were of variable quality from poor to excellent.

North West Region

Feed barley shortages were possible near Warburg and Barrhead. Feed grains were generally of fair quality. Feed and straw supplies were adequate to surplus in all areas except Evansburg where deficits and shortfalls of feed and straw existed.

Peace River Region

Shortage of feed, straw and feed grains were possible in the Spirit River district. The quality of hay and straw in the areas that received excessive moisture was poor to fair. Feed supplies in other districts were adequate, though quality ranged from poor to good.

IV. ANALYSIS OF RESULTS

Income

The program of supply management of fluid milk in Alberta is administered by the Alberta Dairy Control Board. Fluid milk quotas held by the producers are assigned by the Board to the processing plants. The minimum fluid milk prices at farm, wholesale and retail levels are established by an independent Public Utilities Board (PUB). The PUB uses a fluid milk price formula[1] to establish the monthly farm price. The producer price changed three times in 1989, April, August and November. The chronology of the price changes are shown in Table 3.

TABLE 3 FLUID MILK PRICE CHANGES IN 1989

Effective Date	Producer Price $/hL	Wholesale Price ¢/L	Retail Price ¢/L
December 31, 1988	51.07	84	91
April 1, 1989	52.05	85	92
August 7, 1989	53.03	86	93
November 1, 1989	52.05	85	92
December 15, 1989	52.05	86	93
Average	52.04	85.04	92.04

Fluid milk sales increased by one per cent over the previous year to 265.3 million litres from 260.2 million litres in 1988.

[1]The Alberta milk price formula was first adopted in November 1974; there was a major revision on July 1, 1980. A concise description of the formula is given in Appendix E.

The utilization of assigned fluid milk quota in 1989 was 75.84 per cent compared to 74.8 per cent in 1988.

Fluid milk producers shipping milk in excess of designated Class 1 (fluid) milk received a $6.04 per hectolitre (hL) subsidy if the milk was covered by national market share quota. The subsidy was paid in addition to industrial milk prices. To pay for support program expenses, the Canadian Dairy Commission (CDC) imposes an in-quota levy. At the conclusion of the year this levy was $3.03 per hL. In addition to the levy, the CDC continued to impose a 30 cent skim-off levy on fluid milk deliveries.

The over-quota levies collected during the year are usually refunded depending on the provincial quota situation on July 31 (dairy year end). In 1989 the Alberta total deliveries exceeded the MSQ by 0.8 per cent, therefore, there was only a partial refund to the producers.

The diagram on the following page summarizes the quantity, price and utilization of milk in Alberta.

Table 5 portrays the cost of producing milk for the dairy enterprise in Alberta, Tables 6 and 7 display the results of Northern and Southern regions, respectively. Gross income is the sum of milk sales and value for inventory adjustment. During the 1989 production year, the price of fluid milk increased from $51.07 to $53.03 per hectolitre, then dropped to $52.05 at the conclusion of the year. This resulted in a higher blend price of all classes of milk in 1989. The fluid blend price of $48.72 per hectolitre of milk sold was $2.03 higher than the 1988 price. The fluid milk utilization of assigned fluid quota did not play a significant role in the milk price in 1989. Another positive effect on producers income was felt by the reduction in the levies paid by the producers, i.e. in-quota levy as well as over-quota levy. The composite levy per hectolitre of all milk dropped from $1.85 to $1.47. The miscellaneous receipts remained almost unchanged at $0.24 per hectolitre.

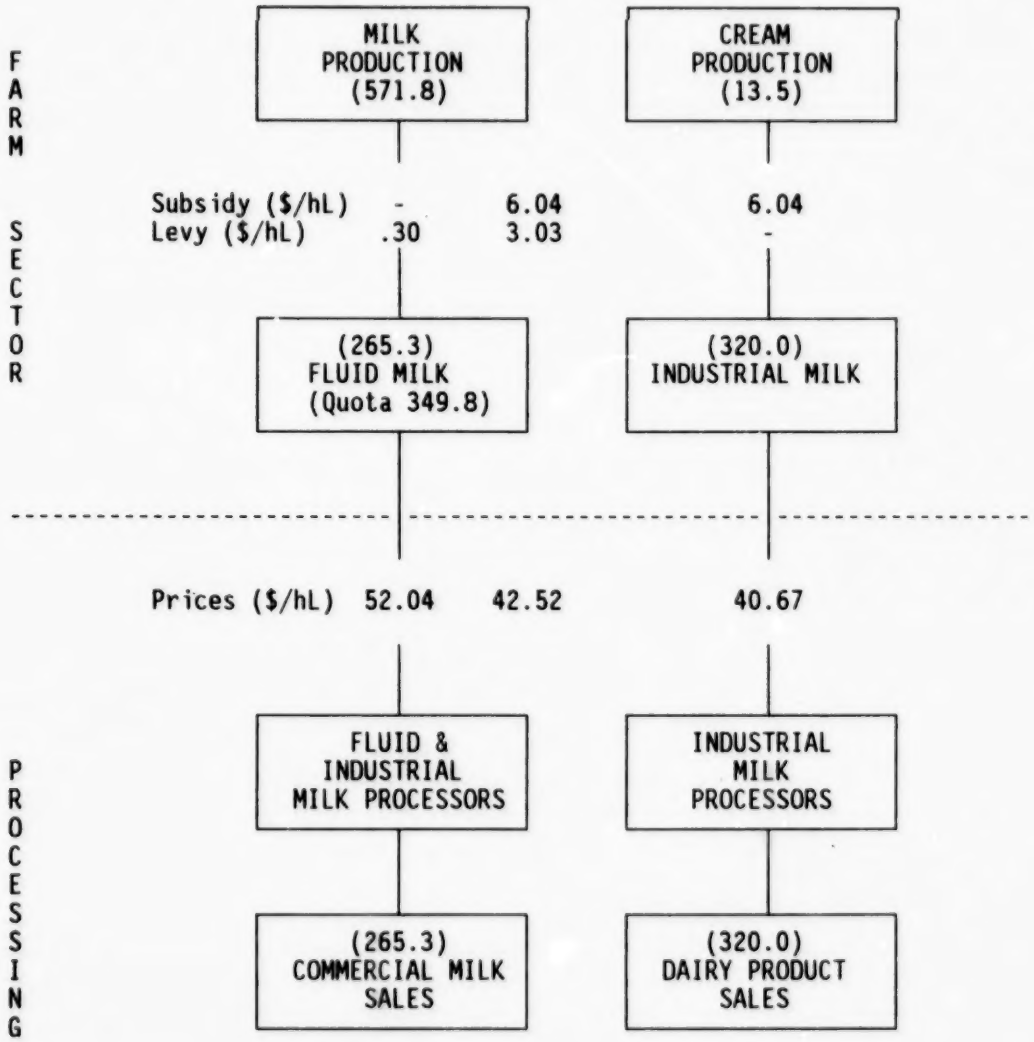
Due to an increase in cow productivity in 1989 compared to 1988, there were gains in income per cow relative to gains on a per hectolitre basis. Income per cow increased by 7.5 per cent, while the income per hectolitre increased by 5.1 per cent.

Inventory adjustment or the value for herd growth and credits increased in 1989 by $44.81 per cow to $332.48 or $4.96 per hectolitre.

The gross income per hectolitre of milk sold averaged $53.68, up 5.1 per cent from $51.08 in 1988.

DIAGRAM 2

- 1989 milk in million litres
- Prices are 1989 averages



- Homogenized
- 2%
- Skim Milk
- Buttermilk
- UHT Milk
- 10% & Whipping Cream

- Butter/Powder
- Cheese
- Ice Cream
- Semi-Fluids

Production Costs

Table 4 shows the average values of the three most significant inputs; capital, labour and feed.

Investment value per cow increased in the 1989 sample by 6.4 per cent over the previous year, while indebtedness remained unchanged at 36 per cent. Feed prices showed a significant increase in 1989. The concentrate blend price jumped by 10.7 per cent from the 1988 price. In addition to the rise in grain prices, the $10.00 feed grain market adjustment program was still in effect. The increase in roughage prices was marginally higher in 1989, the average value for roughage increased by 11.6 per cent in 1989. The hourly rate paid for hired labour increased to $9.12 per hour in the 1989 sample from $8.06 in 1988.

TABLE 4 INPUT PRICES

	1988		1989	
	% Use	Average Price	% Use	Average Price
		$/cow		$/cow
Depreciable Investment		3253		3665
Livestock Investment		2101		2083
Total Investment	36*	5753	36*	6124
		$/tonne		$/tonne
Grain & Concentrate-homegrown	29	74.5	25	95.0
-purchased	71	185.9	75	195.0
Roughage-homegrown	87	63.5	87	72.0
-purchased	13	78.2	13	79.4
		$/hr		$/hr
Labour-hired	29	8.06	31	9.12
-family	71	7.76	69	8.02

*Debt/capital ratio or per cent indebtedness

The above input prices, together with the input volume used on the farm made up the cost structure. The total production cost per hectolitre of milk increased by $4.07 in 1989, from $42.17 to $46.24. While the dairy cash expenses, such as fuel, utilities, medicine, etc. remained quite stable at $11.64 per hectolitre, the feed cost registered the highest increase of 14.9 per cent from $14.35 per hL to $16.49. The feed cost in 1989 accounted for 30.7 per cent of income, up from 28.1 per cent a year ago.

The labour cost in 1989, at $10.17 per hectolitre, accounted for 21.7 per cent of income, up from 18.3 per cent in 1988. Both wage rate and labour use increased slightly in 1989. Indebtedness of 36 per cent in the 1989 sample remained unchanged from 1988.

The total production cost was $46.25 per hectolitre, a 9.7 per cent increase over the $42.17 in 1988.

ALBERTA AVERAGE

TABLE 5 ***** DAIRY ENTERPRISE COSTS AND RETURNS *****

	PER HL. SOLD	PERCENT FROM INCOME	PER HL. SOLD	PERCENT FROM INCOME
INCOME:	1988		1989	
MILK SALES	45.98		47.71	
MILK SUBSIDY	2.56		2.49	
MILK LEVIES (-)	-1.85		-1.47	
MISCELLANEOUS RECEIPTS	0.28		0.24	
NET CATTLE SALES (+-)	3.42		3.72	
NET INVENTORY INCREASE (+-)	0.68		1.00	
GROSS INCOME	51.08	100.00	53.68	100.00
EXPENSES:				
GRAIN	1.79		2.28	
COMPLETE FEED	4.98		5.25	
SUPPLEMENT	1.17		1.50	
MINERALS & VITAMINS	0.36		0.45	
ROUGHAGE	5.99		6.91	
PROCESSING COSTS	0.06		0.10	
TOTAL FEED COSTS	14.35	28.10	16.49	30.71
BEDDING AND SUPPLIES	1.29		1.64	
VET. AND MEDICINE	1.37		1.31	
MILK HAULING	1.67		1.69	
PRODUCER'S FEES	0.79		0.85	
UTILITIES	1.12		1.25	
FUEL, OIL, LUBE	0.57		0.53	
BLDG. & MACH. REPAIRS	1.94		1.93	
TAXES AND INSURANCE	0.71		0.79	
MISCELLANEOUS	1.51		1.66	
TOTAL OTHER COSTS	10.97	21.47	11.64	21.68
HIRED LABOR	2.79		3.42	
FAMILY LABOR	6.57		6.74	
TOTAL LABOR COSTS	9.36	18.32	10.17	18.94
TOTAL OPERATING COSTS	34.67		38.29	
RENT	0.42		0.34	
DEPRECIATION	4.06		4.42	
INTEREST (CAP.DEBT)	3.02		3.18	
TOTAL CAPITAL COSTS	7.50	14.69	7.94	14.80
TOTAL PRODUCTION COST	42.17	82.57	46.24	86.13
RETURN TO CAPITAL	16.41		15.39	
RETURN TO EQUITY	8.90	17.43	7.44	13.87
MILK PRICE	46.69		48.72	
INVENTORY ADJUSTMENT	4.39		4.96	
INTEREST ON EQUITY (%)	15.85		12.81	
INTEREST ON DEBT (%)	9.58		9.58	

NORTHERN ALBERTA AVERAGE

TABLE 6 ***** DAIRY ENTERPRISE COSTS AND RETURNS *****

	PER HL. SOLD	PERCENT FROM INCOME	PER HL. SOLD	PERCENT FROM INCOME
	1988		1989	
INCOME:				
MILK SALES	45.89		47.62	
MILK SUBSIDY	2.68		2.50	
MILK LEVIES (-)	-1.80		-1.52	
MISCELLANEOUS RECEIPTS	0.39		0.20	
NET CATTLE SALES (+-)	3.59		3.36	
NET INVENTORY INCREASE (+-)	0.60		1.10	
GROSS INCOME	51.36	100.00	53.26	100.00
EXPENSES:				
GRAIN	2.01		2.51	
COMPLETE FEED	4.06		4.27	
SUPPLEMENT	1.63		2.17	
MINERALS & VITAMINS	0.45		0.43	
ROUGHAGE	5.86		6.81	
PROCESSING COSTS	0.08		0.15	
TOTAL FEED COSTS	14.09	27.42	16.34	30.68
BEDDING AND SUPPLIES	1.39		1.64	
VET. AND MEDICINE	1.35		1.32	
MILK HAULING	1.60		1.64	
PRODUCER'S FEES	0.88		0.94	
UTILITIES	1.11		1.23	
FUEL, OIL, LUBE	0.58		0.55	
BLDG. & MACH. REPAIRS	1.90		1.78	
TAXES AND INSURANCE	0.68		0.76	
MISCELLANEOUS	1.51		1.28	
TOTAL OTHER COSTS	10.99	21.40	11.15	20.93
HIRED LABOR	2.48		3.03	
FAMILY LABOR	7.62		7.64	
TOTAL LABOR COSTS	10.09	19.65	10.66	20.02
TOTAL OPERATING COSTS	35.17		38.15	
RENT	0.57		0.39	
DEPRECIATION	4.18		4.46	
INTEREST (CAP.DEBT)	3.86		3.64	
TOTAL CAPITAL COSTS	8.60	16.75	8.49	15.94
TOTAL PRODUCTION COST	43.77	85.23	46.64	87.57
RETURN TO CAPITAL	16.19		15.11	
RETURN TO EQUITY	7.58	14.77	6.62	12.43
MILK PRICE	46.77		48.60	
INVENTORY ADJUSTMENT	4.59		4.66	
INTEREST ON EQUITY (%)	14.23		11.70	
INTEREST ON DEBT (%)	9.89		9.79	

SOUTHERN ALBERTA AVERAGE

TABLE 7 ***** DAIRY ENTERPRISE COSTS AND RETURNS *****

	PER HL. SOLD	PERCENT FROM INCOME	PER HL. SOLD	PERCENT FROM INCOME
INCOME:	1988		1989	
MILK SALES	46.09		47.84	
MILK SUBSIDY	2.41		2.47	
MILK LEVIES (-)	-1.91		-1.40	
MISCELLANEOUS RECEIPTS	0.15		0.32	
NET CATTLE SALES (+-)	3.20		4.26	
NET INVENTORY INCREASE (+-)	0.80		0.85	
GROSS INCOME	50.74	100.00	54.34	100.00
EXPENSES:				
GRAIN	1.52		1.93	
COMPLETE FEED	6.11		6.77	
SUPPLEMENT	0.61		0.47	
MINERALS & VITAMINS	0.25		0.47	
ROUGHAGE	6.15		7.05	
PROCESSING COSTS	0.03		0.02	
TOTAL FEED COSTS	14.68	28.93	16.71	30.74
BEDDING AND SUPPLIES	1.16		1.63	
VET. AND MEDICINE	1.39		1.30	
MILK HAULING	1.76		1.77	
PRODUCER'S FEES	0.68		0.70	
UTILITIES	1.13		1.27	
FUEL, OIL, LUBE	0.56		0.50	
BLDG. & MACH. REPAIRS	1.99		2.16	
TAXES AND INSURANCE	0.74		0.82	
MISCELLANEOUS	1.52		2.25	
TOTAL OTHER COSTS	10.94	21.55	12.40	22.83
HIRED LABOR	3.17		4.03	
FAMILY LABOR	5.28		5.36	
TOTAL LABOR COSTS	8.45	16.64	9.40	17.30
TOTAL OPERATING COSTS	34.06		38.51	
RENT	0.24		0.26	
DEPRECIATION	3.91		4.36	
INTEREST (CAP.DEBT)	1.99		2.48	
TOTAL CAPITAL COSTS	6.14	12.10	7.10	13.07
TOTAL PRODUCTION COST	40.20	79.22	45.61	83.94
RETURN TO CAPITAL	16.68		15.83	
RETURN TO EQUITY	10.54	20.78	8.73	16.06
MILK PRICE	46.60		48.91	
INVENTORY ADJUSTMENT	4.15		5.43	
INTEREST ON EQUITY (%)	17.64		14.44	
INTEREST ON DEBT (%)	8.90		9.13	

Returns

Although income increased in 1989 due to milk price increases, the cost of production has increased relatively more, causing a reduction in return to equity. The nominal value of the return declined from $8.90 per hectolitre to $7.44. However the return of 12.8 per cent achieved in 1989 is still reasonable, considering investment certificate rates or government bond rates. One should keep in mind, however, that return to equity in dairy includes allowance for management and risk, consequently the attractiveness of 12.8 per cent return would decline if one moves in the spectrum of dairy producers from well established to new entrants.

The analysis does not include the value of the milk quota. This is also a serious dilemma for new entrants. When actual payment for milk quota has been made, the return is then diluted to 7.3 per cent.

TABLE 8 RETURN TO EQUITY

		1989 Study	Including Quota Value
1.	Dairy Investment ($)	356,881	532,027
2.	Debt ($)	135,985	192,937
3.	Equity ($)	237,842	339,090
4.	Equity ($/hL)	58.17	82.93
5.	Blend Price	48.72	48.72
6.	Other Credits	4.96	4.96
7.	Production Costs	46.24	47.58
8.	Paid Interest	3.18	4.52
9.	Return to Equity ($)	7.44	6.10
10.	% Return (9 ÷ 4)	12.81	7.36

Table 9 illustrates the acceptable total debt load per cow at various levels of milk production and interest rates. The basic repayment capacity is given by gross return, i.e. money available for resource ownership payment, consisting of rent, depreciation, paid and equity interest ($1,043 per cow). This table should be used as a guideline only, as each individual situation is different.

TABLE 9 ACCEPTABLE TOTAL DEBT LOAD PER COW

Milk Production	Interest Rate*					
	10 %	11 %	12 %	13 %	14 %	15 %
4,500 (hL/cow)	3584	3353	3145	2957	2788	2635
5,500	5747	5375	5042	4742	4471	4225
6,000	6836	6395	5998	5641	5318	5026
6,500	7918	7406	6947	6533	6159	5821
7,000	8999	8417	7895	7425	7001	6616

*At 20 Years Repayment Period

Price Formula Comparison With Cost Study Results

Table 10 compares the 1989 cost study with the results of the formula price. Over the years the composite index of the formula was responsible for an increase of 147.3 per cent in the Class 1 price, which in turn contributed to the increase in the effective blend price received by the producers. The supply factors of the formula increased for the same period by 157.7 per cent, while the estimated cost of production increased by 165.9 per cent.

The results indicate that the formula, with minor discrepancies, performed quite well. Although the formula index lagged behind the cost increases, the difference is not alarming and might be corrected the following year. The return to equity per hectolitre increased over the 1973 base by 49.1 per cent, and the asset value increased by 73.2 per cent for the period, leaving 12.8 per cent return to equity compared to 15 per cent in 1973. The freeze on industrial milk prices contributed to this decline as well.

Inflation plays an important role in comparing returns for different periods. If the nominal return is discounted by the inflation rate, the resultant "real return" is more meaningful for comparison.

Two factors in respect to the comparison between cost study and the formula should be mentioned. Namely, the technology change reflected in increases in milk production over the years contributed 3.7 points in the 12.8 return. From Table 10, the equity per farm increased by 162.8 per cent over the 1973 base, however the same equity value per hectolitre increased by only 73.2 per cent because of the improvements in productivity. Secondly, the short term government assistance may have contributed to the changes in farm return. The continuation of these programs is unknown.

The formula responded to the steady increase in cost of production in 1989, triggering the Class 1 milk price upward twice. However, late in the year, the price was once reduced in response to declining feed costs.

TABLE 10 COMPARISON OF 1989 DAIRY STUDY RESULTS WITH MILK PRICE FORMULA

	1973 Base	1989 Study	% Change
1. Dairy Investment ($)	90,513	373,827	313.0
2. Debt ($)	N/A	135,985	N/A
3. Equity ($)	90,513	237,842	162.8
4. Equity ($/hL)	33.58	58.17	73.2
5. Blend Price	19.36	48.72	151.7
6. Other Credits	3.02	4.96	64.2
7. Production Costs	17.39	46.24	165.9
8. Paid Interest	N/A	3.18	N/A
9. Return to Equity	4.99	7.44	49.1
10. % Return (9 ÷ 4)	15	12.8	-
11. Class 1 Price	21.04	52.04	147.34
12. Price Formula Indices	100.00	246.94	146.94
13. Price Formula Supply Indices	100.00	257.68	157.68

Management Profile

Dairy management is concerned with the organizing, planning, directing and supervising of a dairy business. Dairy farmers carry out these functions. In addition, many farmers provide their own labour.

Table 11 provides a cross-section of values of management factors. Estimates for the top 1/3 are given on the first line and the estimates for the bottom 1/3 group are on the second line. For instance, the top 1/3 group in milk production (8088L) spent $1,300.60 per cow on feed, while the bottom 1/3 group spent only $869.60 per cow. Labour use for the two groups was 80 hours per cow and 67 hours, respectively, and cost of producing a hectolitre was $44.63 and $45.85, respectively.

The overall level of management was determined by five factors:

1. Milk production per cow
2. Total cost per hectolitre of milk
3. Milk production for hours of work
4. Feed conversion
5. Milk production for dollar of investment

Top 1/3 producers in all five factors were rated 3 and bottom 1/3 were rated 1. The last column in Table 11 indicates a blend of 1 and 3 for each factor, depending on whether that group had more top managers (closer to 3) or not.

Several conclusions can be derived from Table 11. Producers who are relatively new in dairy (7.1 years) have debt/capital ratio of 0.49, while for most established producers (25.3 years) indebtedness was reduced to 23%. The cost and milk production for the top 1/3 management group were 10.2 and 5.8 per cent, respectively, better than the provincial average.

TABLE 11

PROFILE OF MANAGEMENT FACTORS FOR TOP 1/3 AND BOTTOM 1/3 OF PRODUCERS

TOP 1/3 BOTTOM 1/3 AVERAGES FOR:	MILK PRODUC L/COW	TOTAL COST $/hL	YEARS IN DAIRY	HERD SIZE	INVES PER COW	DEBT/ CAPITAL RATIO	EQUITY RETURN %	FEED COST $/COW	LABOUR HR/COW	OVERALL MGMT RATING
MILK PRODUCTION L/COW	8088 5530	44.63 45.85	17.3 14.2	77.6 67.1	6945 5041	0.32 0.37	18.8 18.3	1300.6 869.6	80 67	2.4 1.8
TOTAL COST $/hL	7168 6883	39.67 53.45	17.8 14.7	77.0 82.0	5468 7240	0.32 0.40	29.3 6.0	1021.1 1191.8	70 94	2.7 1.4
YEARS IN DAIRY	7124 6941	44.99 45.08	25.3 7.1	83.7 60.8	6226 5669	0.23 0.49	18.6 26.5	1079.4 1147.9	75 81	2.2 1.9
HERD SIZE	7097 6843	47.43 44.83	17.1 17.6	103.1 39.6	6564 5936	0.39 0.28	14.3 15.2	1136.2 980.6	78 93	2.0 2.0
INVESTMENT PER COW	7384 5977	51.28 43.76	14.6 15.5	79.8 64.1	8048 4522	0.36 0.34	6.1 23.7	1196.0 975.8	95 69	1.5 2.2
DEBT/CAPITAL RATIO	6845 7001	44.53 49.10	23.6 12.7	76.3 85.6	5846 6096	0.10 0.60	15.2 20.5	1042.6 1163.1	76 84	2.2 2.0
EQUITY RETURN %	7009 6955	41.92 51.23	15.4 14.0	75.6 84.5	5271 7209	0.46 0.33	35.6 1.4	1073.3 1143.1	68 93	2.6 1.5
FEED COST $/COW	5817 7940	43.85 46.80	15.2 13.7	65.5 71.5	5154 6713	0.36 0.39	25.9 17.7	801.4 1389.6	70 82	2.0 2.2
LABOUR HR/COW	6625 7541	43.46 49.04	17.1 15.4	84.3 75.6	5440 7105	0.38 0.33	25.6 8.8	1047.8 1202.5	57 111	2.5 1.7
OVERALL MANAGEMENT RATING	7349 6284	41.55 52.08	18.3 14.6	83.7 83.4	5455 6813	0.38 0.37	27.1 5.5	1100.1 1055.9	67 93	3.0 1.0

Each factor's top 1/3 and bottom 1/3 values are listed in the diagonal.
The remainder values in the line are cross-section values for the same groups.

Overall management is rated 3 for the high group and 1 for the low group.

APPENDIX A

ALBERTA

AVERAGE FARM SUMMARIES

ALBERTA AVERAGE (58)

TABLE 1 ***** DAIRY ENTERPRISE COSTS AND RETURNS *****
1989

	TOTAL ENTERPRISE	PER COW	PER HL. SOLD	PERCENT FROM INCOME
INCOME:				
MILK SALES	195280.78	3199.15	47.71	
MILK SUBSIDY	10187.93	166.90	2.49	
MILK LEVIES (-)	-6034.40	-98.86	-1.47	
MISCELLANEOUS RECEIPTS	997.50	16.34	0.24	
NET CATTLE SALES (+-)	15211.38	249.20	3.72	
NET INVENTORY INCREASE (+-)	4086.34	66.94	1.00	
GROSS INCOME	219729.52	3599.68	53.68	100.00
EXPENSES:				
GRAIN	9341.86	153.04	2.28	
COMPLETE FEED	21488.87	352.04	5.25	
SUPPLEMENT	6156.27	100.85	1.50	
MINERALS & VITAMINS	1828.13	29.95	0.45	
ROUGHAGE	28268.15	463.10	6.91	
PROCESSING COSTS	396.22	6.49	0.10	
TOTAL FEED COSTS	67479.51	1105.47	16.49	30.71
BEDDING AND SUPPLIES	6704.42	109.83	1.64	
VET. AND MEDICINE	5371.14	87.99	1.31	
MILK HAULING	6925.07	113.45	1.69	
PRODUCER'S FEES	3466.93	56.80	0.85	
UTILITIES	5097.64	83.51	1.25	
FUEL, OIL, LUBE	2157.05	35.34	0.53	
BLDG. & MACH. REPAIRS	7900.22	129.42	1.93	
TAXES AND INSURANCE	3213.65	52.65	0.79	
MISCELLANEOUS	6812.20	111.60	1.66	
TOTAL OTHER COSTS	47648.33	780.59	11.64	21.68
HIRED LABOR	14009.54	229.51	3.42	
FAMILY LABOR	27601.60	452.18	6.74	
TOTAL LABOR COSTS	41611.14	681.69	10.17	18.94
TOTAL OPERATING COSTS	156738.98	2567.75	38.29	
RENT	1387.52	22.73	0.34	
DEPRECIATION	18103.69	296.58	4.42	
INTEREST (CAP.DEBT)	13027.75	213.43	3.18	
TOTAL CAPITAL COSTS	32518.96	532.74	7.94	14.80
TOTAL PRODUCTION COST	189257.94	3100.49	46.24	86.13
RETURN TO CAPITAL	62990.55	1031.93	15.39	
RETURN TO EQUITY	30471.59	499.20	7.44	13.87
MILK PRICE			48.72	
INVENTORY ADJUSTMENT			4.96	
INTEREST ON EQUITY (%)			12.81	
INTEREST ON DEBT (%)			9.58	

ALBERTA (58)

TABLE 2 ***** STATEMENT OF INVESTMENT *****
1989

LAND BUILDINGS & EQUIPMENT	AGE	DEPRECIATION	DAIRY INVESTMENT
DAIRY BUILDINGS	9.55	6876.99	161687.10
POWER MACHINERY	5.10	4262.99	28951.22
DAIRY EQUIPMENT	7.09	5884.27	27631.23
OTHER EQUIPMENT	5.34	1079.44	5443.63
TOTAL EQUIPMENT	5.80	11226.70	62026.08
LAND			18352.45
SUPPLIES			4621.09
** SUBTOTAL **		18103.69	246686.72

DAIRY LIVESTOCK	--BEGIN YEAR---- NUMBER	VALUE	--END OF YEAR--- NUMBER	VALUE	AVERAGE VALUE
COWS	61.02	93543.64	62.16	95288.17	94415.90
BRED HEIFERS	16.62	15789.66	17.05	16199.14	15994.40
OPEN HEIFERS	19.14	9568.97	22.71	11353.45	10461.21
HEIFER CALVES	22.19	4437.93	23.24	4648.28	4543.10
BULL CALVES	10.09	1260.78	10.41	1301.72	1281.25
BULLS	0.41	496.55	0.33	393.10	444.83
** SUBTOTAL **	129.47	125097.52	135.90	129183.86	127140.69

TOTAL DAIRY INVESTMENT	373827.41
CAPITAL LOANS	135984.97
OPERATOR EQUITY	237842.44
INVESTMENT PER COW	6124.17
DEBT/CAPITAL RATIO	0.36
CAPITAL TURNOVER (YR)	1.70

------HERD SIZE------

NUMBER OF DAIRY COWS	61.04
NUMBER OF ANIMAL UNITS	100.21
DRY COWS (%)	15.82
CALF CROP (%)	88.80
PASTURE PER COW (AC.)	0.88

-----CATTLE SALES & PURCHASES-----

	NUMBER	SELLING PRICE	NUMBER	PURCHASE PRICE
COWS	15.17	708.32	2.33	1267.39
BRED HEIFERS	1.40	1104.86	0.47	1413.89
OPEN HEIFERS	1.53	770.58	0.02	2500.00
HEIFER CALVES	1.03	301.13	0.07	575.00
BULL CALVES	21.67	213.68		
BULLS	0.60	939.27	0.07	1150.00
TOTAL VALUE		18981.61		3770.22

ALBERTA (58)

TABLE 3 ***** LABOUR AND MANAGEMENT *****
1989

LABOUR	HOURS	VALUE	HOURLY RATE
OPERATOR LABOR	2356.81	21446.93	9.10
HIRED LABOR	1536.05	14009.54	9.12
FAMILY UNPAID LABOR	1083.78	6154.67	5.68
TOTAL	4976.64	41611.14	8.36

RETURN TO FAMILY LABOR	9.27	$/HR.
MAN EQUIVALENTS	1.99	
LABOR HOURS PER COW	81.53	
YEARS FARMING	15.26	

MILK PRODUCTION	HL.	% OF TOTAL	VALUE	PRICE
QUOTA MILK	2980.67	70.31	148808.19	49.92
OVER QUOTA MILK	1088.78	25.68	45286.28	41.59
OTHER MILK SALES	19.57	0.46	956.58	48.89
FED TO LIVESTOCK	150.28	3.54	7168.47	47.70
TOTAL	4239.29	100.00	202219.51	47.70

FLUID QUOTA	791.12	LITRES/DAY
CLASS 1 UTILIZATION	75.84	%
BUTTERFAT TEST	3.69	KG/HL
MILK PRODUCTION PER COW	6944.95	LITRES

MANAGEMENT FACTORS

COST PER HL	46.24	
MILK/FEED (KG) RATIO	1.86	LITRES
MILK/LABOUR (HR) RATIO	85.18	LITRES
MILK/CAPITAL ($) RATIO	1.13	LITRES

ALBERTA (58)

TABLE 4

***** FEED REPORT *****
1989

CONCENTRATES	----PURCHASED----- QUANTITY (TONNES)	PRICE	----HOMEGROWN----- QUANTITY (TONNES)	PRICE
OATS	0.99	130.59	8.25	113.25
BARLEY	28.23	90.38	36.93	89.86
WHEAT	3.34	112.98	0.30	126.31
MIXED GRAIN	2.69	127.42	10.30	98.14
BREW GRAIN (DRY EQ.)	4.64	114.01		
BEET PULP	0.64	172.66		
DAIRY RATION	103.88	192.27		
CALF FEED	4.19	361.57		
SUPPLEMENT	17.18	343.32		
MOLASSES	3.23	79.59		
SALT	0.85	309.84		
MINERALS & VITAMINS	2.03	769.78		
SUBTOTAL ----------	171.90	33512.91	55.79	5302.22
ROUGHAGE				
ALFALFA HAY	41.54	82.88	165.79	75.11
ALFALFA PELLETS	0.95	145.00		
STRAW FED	0.98	29.56	4.37	29.77
GREENFEED	1.86	47.66	11.69	57.70
SILAGE (DRY EQ.)	4.08	55.33	156.11	71.03
SUBTOTAL ----------	49.40	3923.15	337.95	24345.00
GRINDING		396.22		
GRAND TOTAL FEED COSTS ----------		37832.28		29647.23
BEDDING STRAW	21.17	30.37	35.17	29.66

AV.PRICE: CONCENTRATE	170.48	$/TONNE
ROUGHAGE	72.98	$/TONNE
FED PER COW: CONCENTRATE	3.73	TONNES
ROUGHAGE	6.35	TONNES
% HOME GROWN: CONCENTRATE	24.50	%
ROUGHAGE	87.25	%

APPENDIX B

NORTHERN ALBERTA

AVERAGE FARM SUMMARIES

NORTHERN ALBERTA AVERAGE (37)

TABLE 1 ***** DAIRY ENTERPRISE COSTS AND RETURNS *****
1989

	TOTAL ENTERPRISE	PER COW	PER HL. SOLD	PERCENT FROM INCOME
INCOME:				
MILK SALES	185480.45	3127.64	47.62	
MILK SUBSIDY	9742.78	164.29	2.50	
MILK LEVIES (-)	-5937.24	-100.12	-1.52	
MISCELLANEOUS RECEIPTS	767.73	12.95	0.20	
NET CATTLE SALES (+-)	13099.76	220.89	3.36	
NET INVENTORY INCREASE (+-)	4282.60	72.21	1.10	
GROSS INCOME	207436.08	3497.87	53.26	100.00
EXPENSES:				
GRAIN	9768.87	164.73	2.51	
COMPLETE FEED	16613.66	280.15	4.27	
SUPPLEMENT	8468.65	142.80	2.17	
MINERALS & VITAMINS	1680.61	28.34	0.43	
ROUGHAGE	26540.57	447.54	6.81	
PROCESSING COSTS	579.12	9.77	0.15	
TOTAL FEED COSTS	63651.47	1073.32	16.34	30.68
BEDDING AND SUPPLIES	6402.59	107.96	1.64	
VET. AND MEDICINE	5130.61	86.51	1.32	
MILK HAULING	6381.62	107.61	1.64	
PRODUCER'S FEES	3663.68	61.78	0.94	
UTILITIES	4799.63	80.93	1.23	
FUEL, OIL, LUBE	2129.31	35.91	0.55	
BLDG. & MACH. REPAIRS	6942.69	117.07	1.78	
TAXES AND INSURANCE	2970.38	50.09	0.76	
MISCELLANEOUS	4992.85	84.19	1.28	
TOTAL OTHER COSTS	43413.36	732.05	11.15	20.93
HIRED LABOR	11786.80	198.75	3.03	
FAMILY LABOR	29739.48	501.48	7.64	
TOTAL LABOR COSTS	41526.28	700.23	10.66	20.02
TOTAL OPERATING COSTS	148591.11	2505.60	38.15	
RENT	1523.84	25.70	0.39	
DEPRECIATION	17377.85	293.03	4.46	
INTEREST (CAP.DEBT)	14166.46	238.88	3.64	
TOTAL CAPITAL COSTS	33068.14	557.61	8.49	15.94
TOTAL PRODUCTION COST	181659.25	3063.21	46.64	87.57
RETURN TO CAPITAL	58844.97	992.27	15.11	
RETURN TO EQUITY	25776.83	434.66	6.62	12.43
MILK PRICE			48.60	
INVENTORY ADJUSTMENT			4.66	
INTEREST ON EQUITY (%)			11.70	
INTEREST ON DEBT (%)			9.79	

NORTHERN ALBERTA (37)

TABLE 2 ***** STATEMENT OF INVESTMENT *****
1989

LAND BUILDINGS & EQUIPMENT	AGE	DEPRECIATION	DAIRY INVESTMENT
DAIRY BUILDINGS	9.41	7059.13	165863.70
POWER MACHINERY	4.83	3818.36	26033.20
DAIRY EQUIPMENT	6.92	5618.12	26567.94
OTHER EQUIPMENT	6.22	882.24	4293.86
TOTAL EQUIPMENT	5.67	10318.72	56895.01
LAND			15348.43
SUPPLIES			3717.99
** SUBTOTAL **		17377.85	241825.13

DAIRY LIVESTOCK	--BEGIN YEAR---- NUMBER	VALUE	--END OF YEAR--- NUMBER	VALUE	AVERAGE VALUE
COWS	60.05	91272.42	60.68	92217.19	91744.81
BRED HEIFERS	15.76	14968.92	16.43	15610.81	15289.86
OPEN HEIFERS	17.81	8905.41	22.03	11013.51	9959.46
HEIFER CALVES	21.00	4200.00	23.92	4783.78	4491.89
BULL CALVES	9.16	1145.27	9.97	1246.62	1195.95
BULLS	0.49	583.78	0.41	486.49	535.14
** SUBTOTAL **	124.27	121075.80	133.43	125358.40	123217.10
TOTAL DAIRY INVESTMENT					365042.23
CAPITAL LOANS					144684.83
OPERATOR EQUITY					220357.41
INVESTMENT PER COW					6155.48
DEBT/CAPITAL RATIO					0.40
CAPITAL TURNOVER (YR)					1.76

------HERD SIZE------

NUMBER OF DAIRY COWS	59.30
NUMBER OF ANIMAL UNITS	98.02
DRY COWS (%)	16.82
CALF CROP (%)	88.55
PASTURE PER COW (AC.)	0.75

-----CATTLE SALES & PURCHASES-----

	NUMBER	SELLING PRICE	NUMBER	PURCHASE PRICE
COWS	13.38	699.18	1.46	1407.33
BRED HEIFERS	1.08	1040.72	0.43	1004.65
OPEN HEIFERS	1.43	704.99	0.03	2500.00
HEIFER CALVES	1.03	327.97	0.11	575.00
BULL CALVES	20.38	178.14		
BULLS	0.38	1023.26	0.11	1150.00
TOTAL VALUE		15843.08		2743.32

NORTHERN ALBERTA (37)

TABLE 3 ***** LABOUR AND MANAGEMENT *****
1989

LABOUR	HOURS	VALUE	HOURLY RATE
OPERATOR LABOR	2548.32	23189.69	9.10
HIRED LABOR	1487.89	11786.80	7.92
FAMILY UNPAID LABOR	1148.18	6549.79	5.70
TOTAL	5184.39	41526.28	8.01

RETURN TO FAMILY LABOR	8.46	$/HR.
MAN EQUIVALENTS	2.07	
LABOR HOURS PER COW	87.42	
YEARS FARMING	13.19	

MILK PRODUCTION	HL.	% OF TOTAL	VALUE	PRICE
QUOTA MILK	2839.57	70.41	141504.81	49.83
OVER QUOTA MILK	1037.99	25.74	43140.95	41.56
OTHER MILK SALES	15.50	0.38	742.50	47.90
FED TO LIVESTOCK	139.71	3.46	6652.85	47.62
TOTAL	4032.77	100.00	192041.11	47.62

FLUID QUOTA	744.86	LITRES/DAY
CLASS 1 UTILIZATION	75.84	%
BUTTERFAT TEST	3.69	KG/HL
MILK PRODUCTION PER COW	6800.21	LITRES

MANAGEMENT FACTORS

COST PER HL	46.64	
MILK/FEED (KG) RATIO	1.85	LITRES
MILK/LABOUR (HR) RATIO	77.79	LITRES
MILK/CAPITAL ($) RATIO	1.10	LITRES

NORTHERN ALBERTA (37)

TABLE 4

***** FEED REPORT *****
1989

	----PURCHASED-----		----HOMEGROWN-----	
CONCENTRATES	QUANTITY (TONNES)	PRICE	QUANTITY (TONNES)	PRICE
OATS	0.65	104.87	7.09	111.70
BARLEY	38.50	88.86	41.19	89.41
WHEAT			0.20	128.05
MIXED GRAIN	2.17	133.32	14.25	97.72
BREW GRAIN (DRY EQ.)	0.32	133.00		
BEET PULP	0.31	169.11		
DAIRY RATION	77.95	195.90		
CALF FEED	3.19	421.40		
SUPPLEMENT	23.68	340.62		
MOLASSES	5.06	79.49		
SALT	0.80	352.26		
MINERALS & VITAMINS	2.45	572.37		
SUBTOTAL	155.08	30637.53	62.74	5894.26
ROUGHAGE				
ALFALFA HAY	37.76	75.72	189.40	72.19
ALFALFA PELLETS	1.48	145.00		
STRAW FED	1.00	23.92	5.02	29.83
GREENFEED	2.91	47.66	3.54	51.59
SILAGE (DRY EQ.)	3.23	32.74	137.42	66.91
SUBTOTAL	46.38	3342.75	335.37	23197.82
GRINDING		579.12		
GRAND TOTAL FEED COSTS		34559.39		29092.08
BEDDING STRAW	13.23	29.59	34.05	29.71

AV.PRICE: CONCENTRATE	167.71	$/TONNE
ROUGHAGE	69.52	$/TONNE
FED PER COW: CONCENTRATE	3.67	TONNES
ROUGHAGE	6.44	TONNES
% HOME GROWN: CONCENTRATE	28.80	%
ROUGHAGE	87.85	%

APPENDIX C

SOUTHERN ALBERTA

AVERAGE FARM SUMMARIES

SOUTHERN ALBERTA AVERAGE (21)

TABLE 1 ***** DAIRY ENTERPRISE COSTS AND RETURNS *****
1989

	TOTAL ENTERPRISE	PER COW	PER HL. SOLD	PERCENT FROM INCOME
INCOME:				
MILK SALES	212548.35	3315.72	47.84	
MILK SUBSIDY	10972.24	171.17	2.47	
MILK LEVIES (-)	-6205.59	-96.81	-1.40	
MISCELLANEOUS RECEIPTS	1402.32	21.88	0.32	
NET CATTLE SALES (+-)	18931.86	295.33	4.26	
NET INVENTORY INCREASE (+-)	3773.78	58.87	0.85	
GROSS INCOME	241422.95	3766.16	54.34	100.00
EXPENSES:				
GRAIN	8589.52	134.00	1.93	
COMPLETE FEED	30078.51	469.22	6.77	
SUPPLEMENT	2082.08	32.48	0.47	
MINERALS & VITAMINS	2088.06	32.57	0.47	
ROUGHAGE	31311.99	488.46	7.05	
PROCESSING COSTS	73.98	1.15	0.02	
TOTAL FEED COSTS	74224.15	1157.89	16.71	30.74
BEDDING AND SUPPLIES	7236.20	112.88	1.63	
VET. AND MEDICINE	5794.95	90.40	1.30	
MILK HAULING	7882.57	122.97	1.77	
PRODUCER'S FEES	3120.29	48.68	0.70	
UTILITIES	5622.71	87.71	1.27	
FUEL, OIL, LUBE	2205.93	34.41	0.50	
BLDG. & MACH. REPAIRS	9587.31	149.56	2.16	
TAXES AND INSURANCE	3642.27	56.82	0.82	
MISCELLANEOUS	10017.70	156.27	2.25	
TOTAL OTHER COSTS	55109.94	859.71	12.40	22.83
HIRED LABOR	17925.78	279.64	4.03	
FAMILY LABOR	23834.87	371.82	5.36	
TOTAL LABOR COSTS	41760.65	651.46	9.40	17.30
TOTAL OPERATING COSTS	171094.74	2669.05	38.51	
RENT	1147.33	17.90	0.26	
DEPRECIATION	19382.56	302.36	4.36	
INTEREST (CAP.DEBT)	11021.47	171.93	2.48	
TOTAL CAPITAL COSTS	31551.36	492.20	7.10	13.07
TOTAL PRODUCTION COST	202646.10	3161.25	45.61	83.94
RETURN TO CAPITAL	70328.21	1097.11	15.83	
RETURN TO EQUITY	38776.86	604.91	8.73	16.06
MILK PRICE			48.91	
INVENTORY ADJUSTMENT			5.43	
INTEREST ON EQUITY (%)			14.44	
INTEREST ON DEBT (%)			9.13	

SOUTHERN ALBERTA (21)

TABLE 2 ***** STATEMENT OF INVESTMENT *****
1989

LAND BUILDINGS & EQUIPMENT	AGE	DEPRECIATION	DAIRY INVESTMENT
DAIRY BUILDINGS	9.78	6556.08	154305.55
POWER MACHINERY	5.49	5046.40	34079.73
DAIRY EQUIPMENT	7.35	6353.20	29504.63
OTHER EQUIPMENT	4.63	1426.88	7394.66
TOTAL EQUIPMENT	5.97	12826.48	70979.01
LAND			23645.24
SUPPLIES			6212.27
** SUBTOTAL **		19382.56	255142.08

DAIRY LIVESTOCK	--BEGIN YEAR---- NUMBER	VALUE	--END OF YEAR--- NUMBER	VALUE	AVERAGE VALUE
COWS	62.71	97607.32	64.76	100794.20	99200.76
BRED HEIFERS	18.14	17235.71	18.14	17235.71	17235.71
OPEN HEIFERS	21.48	10738.10	23.90	11952.38	11345.24
HEIFER CALVES	24.29	4857.14	22.05	4409.52	4633.33
BULL CALVES	11.71	1464.29	11.19	1398.81	1431.55
BULLS	0.29	342.86	0.19	228.57	285.71
** SUBTOTAL **	138.62	132245.41	140.24	136019.20	134132.30

TOTAL DAIRY INVESTMENT	389274.39
CAPITAL LOANS	120656.66
OPERATOR EQUITY	268617.73
INVESTMENT PER COW	6072.62
DEBT/CAPITAL RATIO	0.31
CAPITAL TURNOVER (YR)	1.61

------HERD SIZE------

NUMBER OF DAIRY COWS	64.10
NUMBER OF ANIMAL UNITS	104.06
DRY COWS (%)	14.18
CALF CROP (%)	89.22
PASTURE PER COW (AC.)	1.09

-----CATTLE SALES & PURCHASES-----

	NUMBER	SELLING PRICE	NUMBER	PURCHASE PRICE
COWS	18.33	720.08	3.86	1173.70
BRED HEIFERS	1.95	1167.43	0.52	2009.09
OPEN HEIFERS	1.71	867.14		
HEIFER CALVES	1.05	254.77		
BULL CALVES	23.95	266.94		
BULLS	1.00	883.29		
TOTAL VALUE		24511.38		5579.52

SOUTHERN ALBERTA (21)

TABLE 3 ***** LABOUR AND MANAGEMENT *****
1989

LABOUR	HOURS	VALUE	HOURLY RATE
OPERATOR LABOR	2019.38	18376.37	9.10
HIRED LABOR	1620.90	17925.78	11.06
FAMILY UNPAID LABOR	970.33	5458.50	5.63
TOTAL	4610.62	41760.65	9.06

RETURN TO FAMILY LABOR	11.06	$/HR.
MAN EQUIVALENTS	1.84	
LABOR HOURS PER COW	71.92	
YEARS FARMING	18.90	

MILK PRODUCTION	HL.	% OF TOTAL	VALUE	PRICE
QUOTA MILK	3229.27	70.15	161676.05	50.07
OVER QUOTA MILK	1178.27	25.60	49066.14	41.64
OTHER MILK SALES	26.73	0.58	1334.07	49.90
FED TO LIVESTOCK	168.91	3.67	8078.17	47.83
TOTAL	4603.18	100.00	220154.42	47.83

FLUID QUOTA	872.62	LITRES/DAY
CLASS 1 UTILIZATION	75.84	%
BUTTERFAT TEST	3.69	KG/HL
MILK PRODUCTION PER COW	7180.89	LITRES

MANAGEMENT FACTORS

COST PER HL	45.61	
MILK/FEED (KG) RATIO	1.88	LITRES
MILK/LABOUR (HR) RATIO	99.84	LITRES
MILK/CAPITAL ($) RATIO	1.18	LITRES

SOUTHERN ALBERTA (21)

TABLE 4

***** FEED REPORT *****
1989

CONCENTRATES	----PURCHASED----- QUANTITY (TONNES)	PRICE	----HOMEGROWN----- QUANTITY (TONNES)	PRICE
OATS	1.57	149.45	10.29	115.14
BARLEY	10.12	100.56	29.44	90.95
WHEAT	9.24	112.98	0.48	125.00
MIXED GRAIN	3.59	121.13	3.33	101.26
BREW GRAIN (DRY EQ.)	12.26	113.14		
BEET PULP	1.22	174.26		
DAIRY RATION	149.57	188.94		
CALF FEED	5.96	305.20		
SUPPLEMENT	5.73	363.03		
MOLASSES	0.01	200.00		
SALT	0.95	247.17		
MINERALS & VITAMINS	1.30	1423.06		
SUBTOTAL	201.52	38579.06	43.54	4259.12
ROUGHAGE				
ALFALFA HAY	48.20	92.76	124.19	82.96
ALFALFA PELLETS				
STRAW FED	0.95	40.00	3.22	29.61
GREENFEED			26.04	59.17
SILAGE (DRY EQ.)	5.56	78.47	189.04	76.32
SUBTOTAL	54.72	4945.76	342.49	26366.23
GRINDING		73.98		
GRAND TOTAL FEED COSTS		43598.80		30625.35
BEDDING STRAW	35.14	30.88	37.15	29.58

AV.PRICE: CONCENTRATE	174.81	$/TONNE
ROUGHAGE	78.83	$/TONNE
FED PER COW: CONCENTRATE	3.82	TONNES
ROUGHAGE	6.20	TONNES
% HOME GROWN: CONCENTRATE	17.77	%
ROUGHAGE	86.22	%

APPENDIX D

MONTHLY QUESTIONNAIRE

Alberta
AGRICULTURE
Production Economics Branch
7000 - 113 Street
Edmonton, alberta T6H 5T6

DAIRY COST SURVEY — INVESTMENT

Name: _____ Year: _____

LOANS	OWING JAN 1	INTEREST RATE	DAIRY %
LAND			29
BUILDINGS			
LIVESTOCK	26	28	
MACHINERY			

SUPPLIES	VALUE JAN 1		
GAS OIL GREASE			
POSTS AND WIRE			
SHAVINGS			30
DAIRY LIVESTOCK SUPPLIES			
RATIONS & SUPPLEMENTS			
OTHER SUPPLIES			

OFFICE USE ONLY

BEGINNING YEAR	NUMBER	PRICE
COWS	27	
BRED HEIFERS		
OPEN HEIFERS		
HEIFER CALVES		
BULL CALVES		
BULLS		

BUILDINGS USED FOR DAIRY	PURCHASED PRICE	YEARS KEPT	DAIRY %
	16		
		20	
			24

TRACTORS & TRUCKS USED FOR DAIRY			
	17		
		21	

DAIRY EQUIPMENT			
	18		
		22	

OTHER EQUIPMENT USED FOR DAIRY			
			25
	19		
		23	

BLDG SITE ACRES CURRENT $/ACRE:			
DAIRY PASTURE VALUE		ACRES:	
FLUID MILK QUOTA (L)			
YEARS IN BUSINESS			
% DAIRY INCOME FROM TOTAL FARM			

APPENDIX E

ALBERTA MILK PRICE FORMULA

Milk sold for consumption in fluid form in Alberta is priced at the producer, wholesale and retail levels by the Public Utilities Board. This is a common procedure in that, for many years, appointed bodies in Canada and the U.S.A. have issued pricing orders designed to ensure adequate supplies of milk for the consuming public. The orders are made following public hearings at which producers, consumer and industry representatives make submission. All systems incorporate some type of quota allocation among milk producers which, when associated with the first grade milk price, provides the incentive to maintain the flow of milk in the cold winter months as well as in the summer.

Formula Pricing

A modification of the above procedure is known as "formula pricing", whereby an equitable price for first grade milk is determined through the use of selected statistical indicators. As milk is considered an essential food in the modern diet, the interests of consumers as well as producers must be considered in the pricing mechanism. Thus an "economic formula", incorporating supply and demand components, is normally used to determine the producer price.

Formula Development in Alberta

In 1973, the Production Economics Branch designed a formula process to permit a comparison with milk price levels over the previous ten years. It was adopted for experimentation over a 12 month period from August, 1973 to August, 1974. Upon presentation and discussion of the results at a hearing in Red Deer in August 1974, the Public Utilities Board ordered the Formula to be used as a pricing mechanism for a test period of one year starting in October, and to be accompanied with a cost of production program to monitor its suitability and to assess adjustments in the formula components if required at the end of the period.

The Alberta Formula

The Alberta Formula consists of seven statistical factors or components. The first five represent the producer's major cost components and return, and therefore are a reflection of his willingness to sell. The last two represent the approximation of demand of the consumers. The weight given to each factor was established with reference to the actual cost structure on the supply side and relative demand elasticities was a guide for setting the weight of the demand side.

TABLE 1

Components of the Alberta Formula

Components		Weighting
1.	Price of 16% Dairy Feed $/Tonne (Alberta)	14
2.	Price of Alfalfa Hay $/Ton (Alberta)	14
3.	Index of Farm Wages (Western Canada)	12
4.	Index of Farm Inputs (Western Canada)	20
5.	Index of Consumer Prices (Canada)	10
6.	Average Weekly Industrial Wages (Alberta)	16
7.	Per Capital Sales of Milk Litres/Month (Alberta)	14
	COMPOSITE	100

Application

A base price of $21.04 per hectolitre for No. 1 milk was established as at August, 1973. This was determined from the results of the 1973 Dairy Cost Study and provided for a return of 15 per cent on sales income. The indices for the month of August, 1973 were converted to 100, which was then equated to the base price of $21.04. Subsequent monthly index conversions were then calculated relative to the base month, and subsequent monthly producer price levels were determined by multiplying the base price by the appropriate "combined indices".

Whenever the present Formula states a change of $0.49 per hL above or below the existing No. 1 producer price, the Public Utilities Board may make an adjustment of $0.98 to the producer and one cent per litre to the consumer.

Changes in the Formula price are calculated monthly by the Production Economics Branch and are forwarded to the Public Utilities Board in time to allow for notifications and price list adjustment by the milk processing firms for the succeeding month.

The current formula will be kept under observation and, subject to results of the cost study and observed statistical trends, will be reviewed from time to time.

PRODUCTION ECONOMICS BRANCH
427-5397